

How to Start and Maintain an Oyster Garden

Step One: Evaluate the Site

Will your site support growth?

The first two things you need to know are whether the location you have chosen for your oyster garden will actually support oyster growth, and whether you will be able to eat the oysters grown at that site. An oyster garden needs to be located where you have 4 basic things:

- the correct range of water salinity
- a minimum water depth
- adequate amounts of oxygen to breathe
- adequate amounts of plankton to eat

Salinity

Oyster growth rates are dependent upon salinity. Salinity is measured in grams of salt per liter of water, or parts per thousand (ppt or ‰). Oysters require a salinity of at least 8 ppt to grow and oyster growth increases with increased salinity. Below 10 ppt salinities, oyster growth rates are generally reduced; some oysters show intermediate growth rates at salinities between 10 – 20 ppt and highest growth rates at high salinities. This may be a function of heritage and oyster seed may be bred for selected salinity in the near future. You can test your water salinity using a simple device known as a hydrometer. Hydrometers may be found easily at pet stores. The map on the opposite page shows the general areas where salinity supports oyster growth.

Another important consideration about salinity is its relationship to oyster diseases. At low salinities (below 10 ppt), MSX (*Haplosporidium nelsoni*) does not persist; and, while Dermo (*Perkinsus marinus*) can survive at these salinities, it does not cause mortality. Raising oysters throughout the entire growing cycle in low salinity can be an effective means of avoiding disease, but it results in a very watery tasting and slow-growing oyster. Generally these are not desirable traits. In addition, oysters grown at some low salinity sites are at risk of mortality from “freshets.” These are sudden influxes of fresh water due to a heavy rainfall.

Water depth

For two reasons your site must have a minimum water depth of one foot, even at the lowest tide: 1) oysters can only filter water and grow when they are submerged

- so they will grow faster if they are always under water; 2) in the winter, when tides and winds may cause your oysters to be exposed at low tide, your oysters may freeze. Oysters can be frozen solid in the water and survive, but they will die if exposed to sub freezing air temperatures.

Dissolved oxygen

Oysters need dissolved oxygen levels in the water of at least 3.2 milligrams per liter, but 5.5 mg/l or more is best for survival and growth. Colder water can hold more oxygen than warmer water. That’s why we often hear of “anoxia events,” (low oxygen situations) in the summer. Generally Virginia’s coastal waters have sufficient oxygen to support oysters grown close to the shore and off the bottom. If you are concerned about oxygen levels, you can measure dissolved oxygen using a field kit.

Plankton

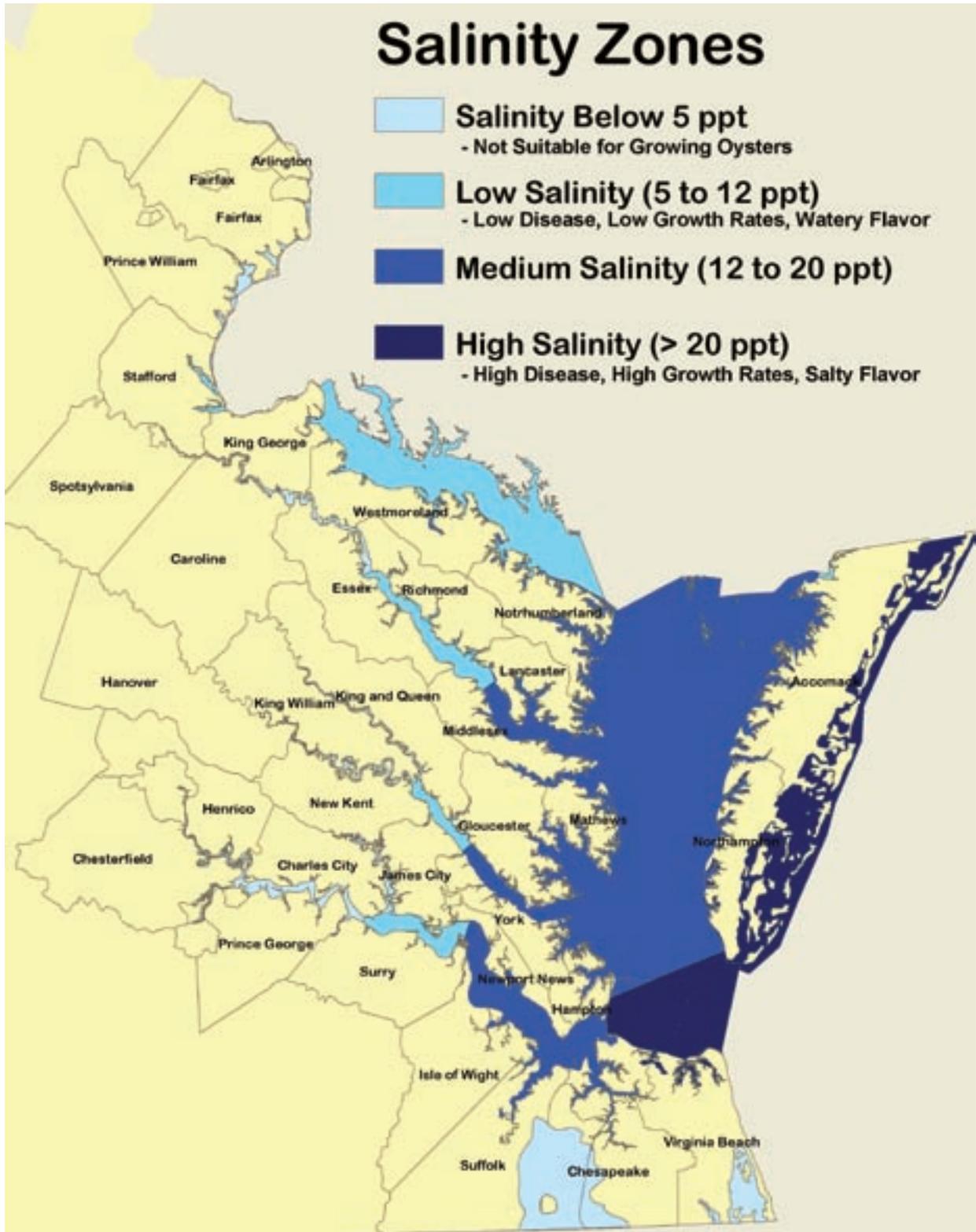
The quantity and quality of food available to oysters can vary considerably from location to location. The quantity and quality are a function of the hydrodynamics at a site (how the water is moving through the site) as well as the abundance of phytoplankton in the water. If you have access to more than one site, you may want to experiment with the different areas to see which produces the biggest oysters. If you have only one location, you may have to evaluate different seed stocks and handling strategies in order to maximize oyster growth and survival.



Photo courtesy of Virginia CZM Program.

Salinity Zones

-  **Salinity Below 5 ppt**
- Not Suitable for Growing Oysters
-  **Low Salinity (5 to 12 ppt)**
- Low Disease, Low Growth Rates, Watery Flavor
-  **Medium Salinity (12 to 20 ppt)**
-  **High Salinity (> 20 ppt)**
- High Disease, High Growth Rates, Salty Flavor



Data Courtesy of Jim Wesson (VMRC)

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Step One: Continued

Will it be safe to eat oysters grown at your site?

Not all gardeners choose to eat their oysters, but if you do, you must determine whether they are safe to eat. To answer this, visit the Virginia Department of Health's online maps of condemned shellfish areas: www.vdh.state.va.us/OEHS/Shellfish/index.asp. VDH's Division of Shellfish Sanitation tries to minimize the risk to humans of disease from shellfish by classifying shellfish waters for safe commercial and recreational harvest.

Because oysters feed by pumping water through their gills and filtering out their microscopic food particles, they may also ingest bacteria and viruses that are in the water. And because oysters, including their intestinal tracts, may be eaten raw, care must be taken to ensure that oysters harvested for consumption are taken from very clean water. Waters approved for harvest of shellfish must be much cleaner than waters approved for swimming and fin-fishing.

VDH determines the safety of waters for shellfish harvest by conducting shoreline surveys and taking fecal coliform samples from the water. The shoreline surveys note the presence of actual and potential sources of pollution. Of primary concern is the presence of fresh human and animal fecal matter. All onsite sewage facilities are investigated to see if they are functioning properly, and all other potential sources of pollution including animal waste, toxic substances, industrial discharges, marinas, wastewater treatment facilities, etc. are inspected. Sewered areas are noted, but not investigated.

The field data and other pertinent information are compiled into a report accompanied by a map of the area. The map shows which properties were inspected and which had an actual or potential pollution source found onsite. The final report and map are sent to the locality and the state agencies responsible for the problems found. VDH investigates about 13,000 properties per year, and conducts new shoreline surveys every 6 to 8 years.

VDH/DSS maintains boats at each of its field offices and collects and analyzes fecal coliform samples monthly at designated stations throughout shellfish growing waters in tidal rivers, Chesapeake Bay and the Seaside of Virginia's Eastern Shore. DSS collects and analyzes about 24,000 seawater samples per year.



See "Step Seven: Harvest" on page 16 for more information on safety and eating oysters. Photo courtesy of CBF.

Some Oyster Facts

The ancient Romans served large quantities of oysters at their banquets, learned to cultivate them, and even made a monetary unit, the denarius, equal in value to one oyster.

Oysters are scientifically classified as molluscs, a word from the Latin meaning soft.

While the power of the adductor muscle varies with the size and condition of the oyster, it takes a pull of over 20 lb suddenly applied, to open the shell of a 3 to 4-inch American oyster in good condition.

There is no way of telling male oysters from females by examining their shells. While oysters have separate sexes, they may change sex one or more times during their life span.

When water chills, oysters cease to feed. The oysters stop filtering and seldom open their shells. However, unlike hibernating bears and other animals which live on stored fat, they show very little weight loss after the winter's sleep.